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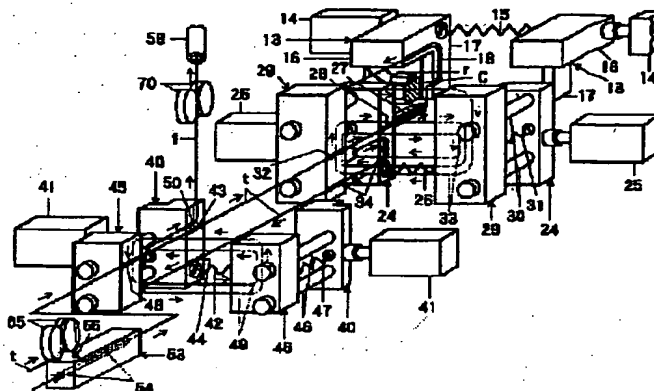
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TITLE : DEVICE FOR TYING ACCESSORIES  
TO COIL OF STATOR



**ABSTRACT :** PURPOSE: To eliminate the labor for mounting accessories by tying accessories such as thermal relay and lead band to the terminal part of a stator coil by a string.

CONSTITUTION: Two pieces of a first block 13 having a longitudinal piece 17 to be inserted in the end part of a coil C and a lateral piece 16 to cross over an accessory (r) on the end part of the coil, two pieces of a second block 24 projecting a bar-like part 27 abutting on the longitudinal piece 16 inserted between the surface of a stator terminal and the terminal part of the coil and two pieces of a third block 29 to be placed upon the lateral piece 16 and the rear surface of the second block are placed forward and backward and left and right. The passages 32, 28, 18 for a string turning around the coil terminal and the accessories between both third blocks, both second blocks and the first block and between the third block and the second block and a passage 33 for a string turning around the passages are formed. A device for inserting a string (t) through the passages for a string by blowing air into the passages for a string, a device for separating each block to take out a string from the passages for a string, a device for moving knots to tighten the string and a device for cutting off both sides of the string are provided.

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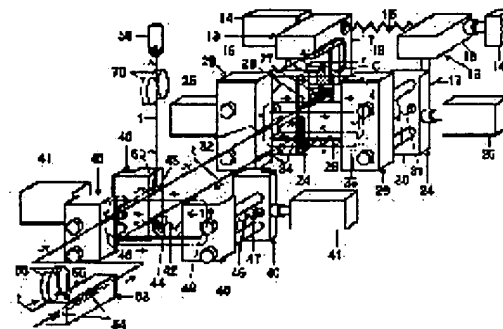
(54) DEVICE FOR TYING ACCESSORIES TO COIL OF STATOR

(57)Abstract:

**PURPOSE:** To eliminate the labor for mounting accessories by tying accessories such as thermal relay and lead band to the terminal part of a stator coil by a string.

**CONSTITUTION:** Two pieces of a first block 13 having a longitudinal piece 17 to be inserted in the end part of a coil C and a lateral piece 16 to cross over an accessory (r) on the end part of the coil, two pieces of a second block 24 projecting a bar-like part 27 abutting on the longitudinal piece 16 inserted between the surface of a stator terminal and the terminal part of the coil and two pieces of a third block 29 to be placed upon the lateral piece 16 and the rear surface of the second block are placed forward and backward and left and right.

The passages 32, 28, 18 for a string turning around the coil terminal and the accessories between both third blocks, both second blocks and the first block and between the third block and the second block and a passage 33 for a string turning around the passages are formed. A device for inserting a string (t) through the passages for a string by blowing air into the passages for a string, a device for separating each block to take out a string from the passages for a string, a device for moving knots to tighten the string and a device for cutting off both sides of the string are provided.



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the equipment which binds accessories, such as a thermal relay and lead pencil of lines, to the coil of the stator of rotating electrical machines, such as a motor and a generator, with thread

[0002]

[Description of the Prior Art] When assembling the stator portion of a rotating electrical machine, a coil is inserted in the slot of a large number inserted in the inner skin of a tubed stator along the direction of an axis, respectively, and the both ends of the coil which projected from the ends side of a stator are fabricated in a predetermined configuration.

[0003] The lead pencil of lines of the thermal relay which detects the overcurrent of a coil, and the coil on which the insulating tube was put are bound to the edge of the coil which projected from the end face of a stator with thread.

[0004]

[Problem(s) to be Solved by the Invention] However, the work which binds accessories, such as a thermal relay and lead pencil of lines, to the edge of the coil of a stator with thread Thread t is inserted in the crevice between the edges of the coil C projected to Stator S an end face and this bottom so that an operator may illustrate to drawing 1 . It connects with the accessory bottom, such as the thermal relay r which laid the both sides of this thread t on the edge of Coil C, and lead pencil of lines, and Accessory r is bound to the edge of Coil C. That is, it is carrying out by the handicraft and takes much time and effort.

[0005] The purpose of this invention is solving the above conventional technical problems.

[0006]

[Means for Solving the Problem] \*\*\*\*\* inserted inside [ which projected this invention to the end-face up side of a stator ] the edge of a coil, The 1st block of two pieces which has horizontal \*\*\*\* which crosses the accessory bottom laid in the edge of a coil, such as a thermal relay and lead pencil of lines The 2nd block of two pieces which projected to the anterior the cylindrical section which carries out a polymerization to right and left, arranges, equips possible [ isolation ] and possible [ rise and fall ], inserts in the crevice between the end face of a stator, and the edge of a coil, and contacts block [ 1st ] \*\*\*\*\* in a coil The 3rd block of two pieces which carries out a polymerization to right and left, arranges, equips possible [ isolation ] and possible [ longitudinal slide movement ], and carries out a polymerization to a block [ 1st ] horizontal \*\*\*\* and a block [ 2nd ] rear face right and left -- a polymerization -- carrying out -- arranging -- isolation -- possible -- and longitudinal slide movement -- possible -- equipping -- both -- between the 3rd block -- both -- between the 2nd block -- both -- between the 1st block and between the 3rd block and the 2nd block The edge of a coil, the thread path which turns around the surroundings of an accessory, and the thread path which turns around the surroundings of this thread path are formed continuously. The thread insertion equipment which blows air into a thread path, or sucks out of a thread path, and inserts thread in a thread path is formed. The block move equipment which separates each block which carried out the polymerization of each block all around, and inserted thread in the thread path, and takes out thread from a thread path is formed. It is equipment which binds an accessory to the coil of the stator characterized by having formed the node move binding equipment which moves and binds the node of the thread taken out from the thread path to the edge side of a coil, and forming the thread cutting equipment which cuts the both sides of the thread which bound the edge and accessory of a coil.

[0007]

[Function] in the equipment of this invention, the polymerization was carried out to right and left -- both -- the 1st block -- descending -- block [ 1st ] \*\*\*\*\* -- the end-face top of a stator -- a protrusion -- while inserting inside the edge of a coil the bottom, block [ 1st ] horizontal \*\*\*\* crosses the accessory bottom laid in the edge of a coil, such as a

thermal relay and lead pencil of lines the polymerization was carried out to right and left -- both -- the 2nd block moves forward, and the block [ 2nd ] cylindrical section inserts in the crevice between the end face of a stator, and the edge of a coil, and contacts block [ 1st ] \*\*\*\*\* in a coil the polymerization was carried out to right and left -- both -- the 3rd block moves forward and a polymerization is carried out to a block [ 1st ] horizontal \*\*\*\* and a block [ 2nd ] rear face That is, each block carries out a polymerization all around.

[0008] Air is blown into the thread path during a polymerization block with thread insertion equipment, or it is sucked out of a thread path, and thread is inserted in a thread path.

[0009] Each block which inserted thread in the thread path dissociates, and thread is taken out from a thread path.

[0010] The node of the thread taken out from the thread path is moved to the edge side of a coil, and is bound with node move binding equipment. That is, the edge and accessory of a coil are bound with thread.

[0011] The both sides of the thread which bound the edge and accessory of a coil are cut by thread cutting equipment.

[0012]

[Effect of the Invention] In the equipment of this invention, accessories, such as a thermal relay and lead pencil of lines, are bound to the edge of the coil of a stator with thread.

[0013] Therefore, binding an accessory to the coil of a stator does not take much time and effort.

[0014]

[Example] this example is shown in drawing 1 -- as -- the end-face top of Stator S -- a protrusion -- it is equipment which binds accessories, such as a thermal relay r and lead pencil of lines, with Thread t on the edge of Coil C the bottom, and is equipment which sets Thread t to double square-knot d, and is further set to single square-knot s

[0015] < style The example of a \*\* > book bound and equipment has formed the equipment which supplies Stator S to an accessory \*\*\*\* attachment position.

[0016] As shown on the level substrate 1 at drawing 4 , a rail 2 is fixed to a cross direction, a movable carriage 3 is constructed on a rail 2, and the positioning shaft 4 of the diameter of two step is perpendicularly protruded on a movable carriage 3. The lower part fits into the positioning shaft 4, and Stator S is positioned on a movable carriage 3, as the chain line shows to drawing 4 .

[0017] As shown in rail 2 posterior on a substrate 1 at drawing 4 , the cylinder 5 was attached in the cross direction and the piston rod of a cylinder 5 is connected with the movable carriage 3. If the advance operation of the cylinder 5 is carried out, as a solid line shows to drawing 4 , a movable carriage 3 will move to the position which fits in or samples Stator S on the positioning shaft 4. If the retreat operation of the cylinder 5 is carried out, as an alternate long and short dash line shows, a movable carriage 3 will move [ at drawing 4 ] to the position which binds an accessory the stator S on it.

[0018] As shown in a substrate 1 at drawing 4 , the support 6 was established, the 1st floor plate 7 was horizontally attached in the lower part of a support 6 possible [ vertical justification ], and the front end of the 1st floor plate 7 is arranged just behind the accessory \*\*\*\* attachment position of Stator S. In the upper part of a support 6, as shown in drawing 4 , the 2nd floor plate 8 was attached horizontally possible [ vertical justification ], and the anterior part of the 2nd floor plate 8 is arranged above the accessory \*\*\*\* attachment position of Stator S.

[0019] The 1st block and its move equipment for double square knot are formed in the anterior part of the 2nd floor plate 8.

[0020] On the anterior part of the 2nd floor plate 8, as shown in drawing 4 and drawing 5 , a cylinder 9 is attached perpendicularly, the piston rod of a cylinder 9 is projected to the 2nd floor plate 8 down side, and the center section of the rail 10 is fixed to the soffit of the piston rod of a cylinder 9. As shown in the cylinder 9 right-hand-side position and left-hand side position of the 2nd floor plate 8 at drawing 5 , bearing of the guidance shaft 11 was penetrated and carried out, the edge of right and left of a rail 10 was fixed at the soffit of the guidance shaft 11 on either side, and the rail 10 is arranged to the 2nd floor plate 8 down side at the longitudinal direction, respectively.

[0021] it is shown in a rail 10 at drawing 4 and drawing 5 -- as -- two pieces 12 of a move -- fitting in -- the inferior surface of tongue of the piece 12 of a move on either side -- respectively -- the object for double square knot -- 13 [ block / 1st ] is fixed it is shown in the edge of right and left of a rail 10 at drawing 5 -- as -- respectively -- a cylinder 14 -- a longitudinal direction -- attaching -- the piston rod of the cylinder 14 on either side -- respectively -- right and left -- the 1st block is in contact with the superficies of 13 Between the 1st block 13 on either side, as shown in drawing 3 , the spiral spring 15 is inserted in. if the advance operation of both the cylinders 14 is carried out, the spiral spring 15 will compress -- having -- both -- 13 approaches and carries out the polymerization of the 1st block if the retreat operation of both the cylinders 14 is carried out -- the spiral spring 15 -- restoring -- elongating -- both -- 13 [ block / 1st ] isolates

[0022] 13 has projected \*\*\*\*\* 17 downward to the front end of horizontal \*\*\*\* 16, as the 1st block is shown in drawing 4 . The 1st block of the thread path 18 of the shape of a slot inserted in the rear face of horizontal \*\*\*\* 16 from the lower rear face of \*\*\*\*\* 17 is formed in the inside of 13 as shown in drawing 3 .

[0023] if a cylinder 9 is descent-operated or elevation operated -- a rail 10 -- descent -- or -- going up -- both -- 13 descends or goes up the 1st block While \*\*\*\*\* 17 will insert inside the edge of the coil C of the stator of an accessory \*\*\*\* attachment position as shown in drawing 3 if 13 descends the 1st block, horizontal \*\*\*\* 16 crosses the right above position of the accessory r on the edge of Coil C to a cross direction.

[0024] The 4th, and the 5th blocks and the last blocks the 2nd for double square knot, the 3rd block, and for single square knot, and those move equipments are formed in the 1st floor plate 7.

[0025] As shown on the 1st floor plate 7 at drawing 5 , the cylinder 19 and the rail 20 were attached in the cross direction, respectively, the 1st move board 21 was constructed on the rail 20, and the piston rod of a cylinder 19 is connected with the 1st move board 21.

[0026] on the front end of the 1st move board 21, it is shown at drawing 5 -- as -- a rail 22 -- a longitudinal direction -- fixing -- a rail 22 top -- two pieces 23 of a move -- fitting in -- the upper surface of the piece 23 of a move on either side -- respectively -- the object for double square knot -- 24 [ block / 2nd ] is fixed

[0027] it is shown in the edge of right and left of a rail 22 at drawing 5 -- as -- respectively -- a cylinder 25 -- a longitudinal direction -- attaching -- the piston rod of the cylinder 25 on either side -- respectively -- right and left -- the 2nd block is in contact with the superficies of 24 Between the 2nd block 24 on either side, as shown in drawing 3 , the spiral spring 26 is inserted in. if the advance operation of both the cylinders 25 is carried out, the spiral spring 26 will compress -- having -- both -- 24 approaches and carries out the polymerization of the 2nd block if the retreat operation of both the cylinders 25 is carried out -- the spiral spring 26 -- restoring -- elongating -- both -- 24 [ block / 2nd ] isolates

[0028] As shown in drawing 3 , 24 projects the cylindrical section 27 in a front face, and forms the 2nd block of the thread path 28 of the shape of a slot inserted in the front end side of the cylindrical section 27 from a rear face at an inside.

[0029] if a cylinder 19 is advance-operated or retreat operated -- the 1st move board 21 -- advance -- or -- retreating -- both -- 24 [ block / 2nd ] moves forward or retreats if 24 [ block / 2nd ] moves forward -- the cylindrical section 27 -- accessory \*\*\*\* attachment position the end face and this top of Stator S -- a protrusion -- it inserted in the crevice between the edges of Coil C the bottom, and inserted inside the edge of Coil C -- the 1st block contacts \*\*\*\*\* 17 of 13 Then, the 2nd block of the 1st block of the thread path 28 of 24 connects with the thread path 18 of 13.

[0030] right and left -- the 2nd block is shown in the rear face of 24 at drawing 3 -- as -- respectively -- the object for double square knot -- the nose of cam of two guidance shafts 30 penetrated to 29 the 3rd block was fixed, 29 [ block / 2nd / block / 3rd ] was attached in the posterior of 24 possible / longitudinal slide movement /, and the 2nd block / 3rd block has fitted in the spiral spring 31 between 29 with 24 The 3rd block of the thread path 32 of the shape of a slot inserted in a front face from a rear face is formed in the inside of 29 as shown in drawing 3 .

[0031] both -- if 29 [ block / 3rd ] is pushed on an anterior, the spiral spring 31 will compress -- having -- both -- the 3rd -- block 29 -- both -- the polymerization of the 2nd block is approached and carried out to 24 Then, the 3rd block of the 2nd block of the thread path 32 of 29 connects with the thread path 28 of 24. both -- if the force of pushing 29 [ block / 3rd ] on an anterior is abolished -- the spiral spring 31 -- restoring -- elongating -- both -- the 3rd -- block 29 -- both -- the 2nd block isolates from 24

[0032] As shown in drawing 3 , the thread path 33 of the shape of a slot which carries out a 2 rotation half of the surroundings of the thread path 32 to the shape of a whorl is formed, the entrance and outlet of the thread path 33 are arranged to thread path 32 a top and the bottom, and the 2nd block of the inside of 24 and the thread path 34 of the shape of a slot from the outlet of the thread path 33 to the rear face of 29 the 3rd block are formed in the front face

[0033] the polymerization of 29 [ block / 3rd ] was carried out to the rear face -- when 24 / block / 2nd ] moved forward, the front upper part of 29 crossed the 3rd block of the right above position of the accessory r on the edge of the coil C of the stator S of an accessory \*\*\*\* attachment position to the cross direction -- the polymerization of the 1st block is carried out to horizontal \*\*\*\* 16 rear face of 13 Then, the 3rd block of the 1st block of the outlet of the thread path 18 of 13 connects with the entrance of the spiral thread path 33 of 29.

[0034] As shown in rail 22 posterior on the 1st move board 21 at drawing 6 , the cylinder 35 and the rail 36 were attached in the cross direction, respectively, the 2nd move board 37 was constructed on the anterior part of a rail 36, and the piston rod of a cylinder 35 is connected with the 2nd move board 37.

[0035] on the 2nd move board 37, it is shown at drawing 6 -- as -- a rail 38 -- a longitudinal direction -- fixing -- a rail

38 top -- two pieces 39 of a move -- fitting in -- the upper surface of the piece 39 of a move on either side -- respectively -- the object 4th for single square knot -- block 40 -- fixing -- the edge of right and left of a rail 38 -- respectively -- a cylinder 41 -- a longitudinal direction -- attaching -- the piston rod of the cylinder 41 on either side -- respectively -- right and left -- the 4th block is in contact Between the 4th block 40 on either side, as shown in drawing 3 , the spiral spring 42 is inserted in.

[0036] if the advance operation of both the cylinders 41 is carried out, the spiral spring 42 will compress -- having -- both -- 40 approaches and carries out the polymerization of the 4th block if the retreat operation of both the cylinders 41 is carried out -- the spiral spring 42 -- restoring -- elongating -- both -- 40 [ block / 4th ] isolates

[0037] The 4th block of the thread path 43 of the shape of a slot inserted in a front face from a rear face and the thread path 44 of the shape of a slot inserted in a rear face from a front face are formed in the inside of 40 up and down, as shown in drawing 3 .

[0038] if a cylinder 35 is advance-operated or retreat operated -- the 2nd move board 37 -- advance -- or -- retreating -- both -- 40 [ block / 4th ] moves forward or retreats If 40 [ block / 4th ] moves forward, as shown in drawing 2 , the front inside section of 40 will carry out the polymerization of the 3rd block / 4th / block in contact with the rear face of 29, and 29 / block / 3rd ] will be pushed on an anterior. Then, while the 4th block of the 3rd block of the thread path 43 of 40 tops connects with the thread path 32 of 29 tops, the 4th block of the 3rd block of the thread path 34 of 29 bottoms connects with the thread path 44 of 40 bottoms.

[0039] right and left -- the 4th block is shown in the rear face of 40 at drawing 3 -- as -- respectively -- the object for single square knot -- the nose of cam of two guidance shafts 46 penetrated to 45 the 5th block was fixed, 45 [ block / 4th / block / 5th ] was attached in the posterior of 40 possible / longitudinal slide movement / , and the 4th block of the 5th block of the spiral spring 47 is inserted in between 45 with 40 The 5th block of the thread path 48 of the shape of a slot inserted in a front face from a rear face is formed in the inside of 45 as shown in drawing 3 . The thread path 49 of the shape of a slot on either side which carries out a one-revolution half of the surroundings of the thread path 48 to the shape of a whorl as shown in the front face of 45 at drawing 3 is formed, the entrance and outlet of the thread path 49 are arranged to thread path 48 the bottom and the bottom, and the 4th block of the 5th block of the thread path 50 of the shape of a slot inserted in the upper surface from a rear face at the inside of 40 is formed.

[0040] both -- if 45 [ block / 5th ] is pushed on an anterior, the spiral spring 47 will compress -- having -- both -- the 5th -- block 45 -- both -- the polymerization of the 4th block is approached and carried out to 40 Then, the 5th block of the 4th block of the thread path 48 of 45 connects with the thread path 43 of 40, the 5th block of the 4th block of the thread path 44 of 40 connects with the entrance of the spiral thread path 49 of 45, and the 5th block of the 4th block of the outlet of the spiral thread path 49 of 45 connects with the thread path 50 of 40. both -- if the force of pushing 45 [ block / 5th ] on an anterior is abolished -- the spiral spring 47 -- restoring -- elongating -- both -- the 5th -- block 45 -- both -- the 4th block isolates from 40

[0041] As shown on the rail 36 on the 1st move board 21 at drawing 4 , the 3rd move board 51 was constructed over the posterior position of the 2nd move board 37, the cylinder 52 was attached in the 3rd move board 51 at the cross direction, and the piston rod of a cylinder 52 is connected with the 2nd move board 37.

[0042] On the anterior part of the 3rd move board 51, as shown in drawing 4 , the last block 53 is projected to an anterior and it is fixing. the entrainment penetrated on a rear face from a front face as the last block 53 is shown in drawing 3 -- a hole 54 -- forming -- from the upper surface -- blowing in -- a hole 54 -- on the way -- thread insertion alike and open for free passage -- the hole 55 is formed

[0043] If a cylinder 52 is retreat-operated or advance operated, the 3rd move board 51 will move forward or retreat to the 2nd move board 37, and the 5th block of the 4th block of the last block 53 will advance or retreat to 45 with 40. when the 5th block of the last block 53 advances to 45, it is shown in drawing 2 or drawing 4 -- as -- the front face of the last block 53 -- both -- the 5th -- the rear face of block 45 -- contacting -- a polymerization -- carrying out -- both -- 45 [ block / 5th ] is pushed on an anterior Then, the last block 53 blows in and the 5th block of the outlet of a hole 54 connects with the thread path 48 of 45.

[0044] The equipment which blows air into a thread path, and sucks air out of a thread path, and inserts Thread t in a thread path is formed.

[0045] It blew in, and as shown in drawing 2 , it has connected with the entrance of a hole 54 through the control equipment which does not illustrate a high-pressure air generator 56 like an air compressor.

[0046] On the posterior part of the 3rd move board 51, as shown in drawing 4 , the cylinder 57 was attached perpendicularly, the middle of the siphon 58 was fixed to the upper limit of the piston rod of a cylinder 57 at the cross direction, the front end of the siphon 58 was bent downward, and the 4th block of the downward front end of the siphon

58 is connected to the outlet of the thread path 50 in contact with the upper surface of 40. As shown in drawing 2 , a suction system 59 like a vacuum pump is connected to the back end of the siphon 58. If the elevation operation of the cylinder 57 is carried out, the siphon 58 will go up and the 4th block of the front end of the siphon 58 will isolate from the upper surface of 40. If the downward operation of the cylinder 57 is carried out, the siphon 58 will return to a former position.

[0047] On the 3rd move board 51, delivery of Thread t is controlled or the equipment which becomes it tense about Thread t is formed.

[0048] On the flank of the 3rd move board 51, as shown in drawing 7 , the 1st tie-down plate 60 is established, it arranges to a cross direction, and the 2nd tie-down plate 61 and the 3rd tie-down plate 62 are fixed to the up inside side of the 1st tie-down plate 60, among them, an interval is prepared and the 1st tie-down plate 60, the 2nd tie-down plate 61, and the 3rd tie-down plate 62 are arranged in parallel.

[0049] As shown in the superficies of the 1st tie-down plate 60 at drawing 7 , the motor 63 was attached, the clutch 64 for transfer torque limitation was attached between the 1st tie-down plate 60 and the 2nd tie-down plate 61, and the entrance-side thread delivery roller 65 of a couple is attached forward and backward between the 2nd tie-down plate 61 and the 3rd tie-down plate 62. The axis of rotation of a motor 63 is connected with the anterior roller of the entrance-side thread delivery roller 65 through the clutch 64 for transfer torque limitation. If a motor 63 is normal-rotation-driven or inversion driven, the anterior roller of the entrance-side thread delivery roller 65 will be rotated normally or reversed.

[0050] Longitudinal slide movement of the posterior roller of the entrance-side thread delivery roller 65 was made possible, and as shown in drawing 7 , the cylinder 66 is attached in the back end of the 2nd tie-down plate 61 and the 3rd tie-down plate 62 at the cross direction. The piston rod of a cylinder 66 is connected with the posterior roller of the entrance-side thread delivery roller 65. If the advance operation of the cylinder 66 is carried out, the posterior roller of the entrance-side thread delivery roller 65 will move forward, and the anterior roller of the entrance-side thread delivery roller 65 will be contacted by the predetermined force. If the retreat operation of the cylinder 66 is carried out, the posterior roller of the entrance-side thread delivery roller 65 will retreat, it will isolate from the anterior roller of the entrance-side thread delivery roller 65, and the crevice which inserts in Thread t between the rollers 65 of order will be made.

[0051] Behind the entrance-side thread delivery roller 65, as shown in drawing 2 , the spool 67 is arranged. the thread t sent out from the spool 67 is shown in drawing 3 -- as -- between the entrance-side thread delivery rollers 65 -- letting it pass -- thread insertion of the last block 53 -- it blows in from a hole 55 and inserts in the outlet side of a hole 54

[0052] As shown in the superficies of the 1st tie-down plate 60 at drawing 6 , the motor 68 was attached, the clutch 69 for transfer torque limitation was attached between the 1st tie-down plate 60 and the 2nd tie-down plate 61, and the posterior roller of the outlet side thread delivery roller 70 of a couple is attached between the 2nd tie-down plate 61 and the 3rd tie-down plate 62. The axis of rotation of a motor 68 is connected with the posterior roller of the outlet side thread delivery roller 70 through the clutch 69 for transfer torque limitation. If the rotation drive of the motor 68 is carried out, the posterior roller of the outlet side thread delivery roller 70 will rotate.

[0053] As shown in the anterior part and the posterior part of the 2nd tie-down plate 61 at drawing 4 , the lever 71 and the cylinder 72 were attached, the piston rod of a cylinder 72 was connected with the back upper limit of a lever 71, and the anterior roller of the outlet side thread delivery roller 70 is attached in the front end of a lever 71. If the advance operation of the cylinder 72 is carried out after the siphon 58 has gone up, the anterior roller of the outlet side thread delivery roller 70 will rotate to a lower posterior, will cross block [ 4th ] between the outlet of the thread path 50 of 40, and the front end of the siphon 58, and will contact the posterior roller of the outlet side thread delivery roller 70 by the predetermined force.

[0054] The equipment which makes the 2nd floor plate 8 move the node of Thread t to the edge side of the coil C of Stator S is formed.

[0055] As shown in drawing 4 , the square aperture 73 was formed, the rail 74 was fixed to the anterior and posterior of an aperture 73 on the 2nd floor plate 8 at the longitudinal direction, respectively, and the node move equipment for single square knot is provided in one edge of both the rails 74 for the node move equipment for double square knot in the other-end section at cylinder 9 posterior for the 1st block rise and fall of the 2nd floor plate 8, respectively.

[0056] Both node move equipment is the same structure, as are shown in drawing 4 , and the 4th move board 75 is constructed on the edge of both the rails 74 and it is shown in drawing 6 or drawing 7 , attached the cylinder 76 in the 4th move board 75 outside position on the 2nd floor plate 8 at the longitudinal direction, and has connected the piston rod of a cylinder 76 with the 4th move board 75. If a cylinder 76 is advance-operated or retreat operated, the 4th move



board 75 will move to the inside or an outside.

[0057] As shown on the 4th move board 75 at drawing 4, two guidance shafts 77 were established forward and backward, and the upper limit of both the guidance shaft 77 was built over the connecting plate 78, it fixed, the cylinder 79 was perpendicularly attached on the connecting plate 78, the piston rod of a cylinder 79 was projected to the connecting-plate 78 down side, the 5th move board 80 was penetrated on both the guidance shaft 77, and the piston rod of a cylinder 79 is connected with the 5th move board 80. If a cylinder 79 is elevation-operated or downward operated, the 5th move board 80 will go up or descend.

[0058] As shown in the inferior surface of tongue of the 5th move board 80 at drawing 6, the rail 81 was fixed to the cross direction, the 6th move board 82 was fitted into the rail 81, the cylinder 83 was attached in the back end of the 6th move board 82 at the cross direction, and the piston rod of a cylinder 83 is connected with the 6th move board 82. If a cylinder 83 is advance-operated or retreat operated, the 6th move board 82 will move forward or retreat.

[0059] As shown in the 6th move board 82 at drawing 6, an arm 84 is fixed perpendicularly, an aperture 73 is penetrated, the soffit of an arm 84 is projected to the 2nd floor plate 8 down side, and two thread-guard rods 85 for double square knot or two thread-guard rods 86 for single square knot are protruded on the soffit inside of an arm 84. As shown in drawing 6, the thread-guard rod 85 for double square knot and the thread-guard rod 86 for single square knot have been arranged on both sides of the block group on the 1st move board 21, and are projected to the block group side. Both 85 and 86 move to right and left, the upper and lower sides, and order by the operation of cylinders 76, 79, and 83, respectively.

[0060] The equipment which cuts the both sides of the node of the thread t which bound the edge and Accessory r of Coil C is formed in the 2nd floor plate 8.

[0061] As shown in cylinder 9 anterior for the 1st block rise and fall of the 2nd floor plate 8 at drawing 4, a scuttle 87 is formed, a cylinder 88 is attached toward a scuttle 87 at the lower posterior sense on the 2nd floor plate 8, the piston rod of a cylinder 88 is penetrated to a scuttle 87, and the cutter 89 is fixed to the soffit of the piston rod of a cylinder 88. As shown in drawing 5, a cutter 89 has the shape of a hook which formed the edge inside the nose of cam of V configuration, and is projected to the 2nd floor plate 8 down side. If the advance operation of the cylinder 88 is carried out where both the 1st block 13 is divided into right and left, a cutter 89 will pass through the right above posterior position of the accessory r on the coil C of the stator S of an accessory \*\*\*\* attachment position aslant, and will be projected. If the retreat operation of the cylinder 88 is carried out, a cutter 89 will withdraw into a just under [ the 2nd floor plate 8 ] position.

[0062] < \*\* The \*\* example of > book binds, and equipment has each moving part in the position shown in drawing 4 just before an operation.

[0063] First, as shown in the positioning shaft 4 of a movable carriage 3 which stopped in the stator fitting sampling position at drawing 4, Stator S fits in, and is positioned and Accessory r is laid on the posterior part of the edge of the coil C of Stator S. A movable carriage 3 moves to an accessory \*\*\*\* attachment position. As shown in drawing 8 and drawing 9, the stator S on a movable carriage is arranged in an accessory \*\*\*\* attachment position, and the posterior part of the edge of Coil C and the 1st block of the accessory r on it are the lower parts of 13, and it is located the 2nd block just before 24.

[0064] next -- both -- the 1st block, 13 descends, where a polymerization is carried out to right and left As 13 is shown in drawing 10 and drawing 11, while \*\*\*\*\* 17 is inserted inside the edge of Coil C, horizontal \*\*\*\* 16 crosses the 1st block of the right above position of the accessory r on the edge of Coil C to a cross direction.

[0065] the 2- which the 1st move board 21 moved forward and carried out the polymerization before and after the right and left on the 1st move board 21 -- the 5th block, the last block, etc. are united and advance The 2nd block, as shown in drawing 10, the cylindrical section 27 of 24 is inserted in the crevice between the edges of the coil C projected to Stator S an end face and this bottom, and contacts \*\*\*\*\* 17 of 13 the 1st block. The 2nd block of the 1st block of the thread path 28 of 24 is connected to the thread path 18 of 13. Moreover, as shown in drawing 10 and drawing 11, the polymerization of the 3rd block of the 1st block of the front upper part of 29 is carried out to horizontal \*\*\*\* 16 of 13. The 3rd block of the 1st block of the thread path 18 of 13 connects with the spiral thread path 33 of 29.

[0066] If it connects with the thread path 18 whose thread path of the polymerization block group on the 1st move board 21 is the 1st block, while the last block will blow in from the high-pressure air generator 56 and high-pressure air will be blown into a hole 54, a suction system 59 operates and the air in the suction pipe 58 is sucked out. the entrainment of the last block -- the [ the thread paths 48, 43, 32, and 28 of the block group on / a hole 54 to / the 1st move board 21 the block / 1st / thread path 18, and ] -- pass the thread paths 33, 34, 44, 49, and 50 of the block group on 1 move board 21 -- the airstream which results in the suction pipe 58 occurs The normal rotation drive of the

anterior roller is carried out, and both the rollers that contacted forward and backward rotate the entrance-side thread delivery roller 65 normally.

[0067] then, pass between the entrance-side thread delivery rollers 65 from a spool 67 -- thread insertion -- the thread t which blew in from the hole 55 and was inserted in the hole 54 is conveyed by the airstream -- having -- an entrainment -- it is inserted in the thread path and the suction pipe 58 of a hole 54 and each block one by one

[0068] an entrainment -- the nose of cam of the thread t which passed the hole 54 -- the Ming kana from the decomposition perspective diagram of drawing 3 -- like, it passes through the a block [ 5th ] thread path 48, the a block [ 4th ] thread path 43, the a block thread path 32, the a block thread path 28, the block thread path 18, and the thread path 33 of the shape of a block swirl one by one, and the thread path (the 2nd block and the 3rd block) 34 be arrived at That is, Thread t turns the surroundings of the edge of Coil C, and the accessory r on it, rotates the surroundings of the portion before the edge of Coil C and the portion which passed the surroundings of Accessory r pass two times, and is arranged at the path for double top epilogues.

[0069] furthermore, the nose of cam of the thread t which passed through the block [ 3rd ] thread path 34 -- the Ming kana from the decomposition perspective diagram of drawing 3 -- like, it passes through the block [ 4th ] thread path 44, the thread path 49 of the shape of a block [ 5th ] swirl, and the block [ 4th ] thread path 50 one by one, and the suction pipe 58 is reached That is, Thread t turns the surroundings of the portion before the portion which passed the path for double top epilogues passes, and is arranged at the path for single top epilogues.

[0070] If the nose of cam of Thread t is inserted in the suction pipe 58, while it will blow in and sucking of the air from the entrainment and the suction pipe 58 of air to a hole 54 will stop, the entrance-side thread delivery roller 65 stops.

[0071] next -- both -- it goes up, 13 [ block / 1st ] separating into right and left It exposes and the thread t inserted in the thread path 18 of 13 the 1st block is left, as shown in drawing 12 . On the other hand, the 1st move board 21 retreats and it retreats [ the block group which carried out the polymerization before and after the right and left on the 1st move board 21 is united, and ]. As the 2nd block [ 3rd ] block indicated to be 24 in 29 to drawing 12 , the 1st block dissociates from 13 and the 2nd block of the cylindrical section 27 of 24 is extracted from the crevice between the end face of Stator S, and the edge of Coil C, respectively. The thread t which results in 29 the 3rd block from the cylindrical section 27 of 24 the 2nd block passes the edge of Coil C, Accessory r bottom, the inside, and the bottom, as shown in drawing 12 .

[0072] The suction pipe 58 goes up. As shown in drawing 13 , an anterior roller rotates to a lower posterior, and the outlet side thread delivery roller 70 contacts a posterior roller, and pinches the thread t from 40 to [ with both rollers ] the suction pipe 58 the 4th block. The inversion drive of the anterior roller is carried out, both rollers reverse the entrance-side thread delivery roller 65, and the thread t pinched by both rollers is returned. The thread t from the entrance-side thread delivery roller 65 to the outlet side thread delivery roller 70 becomes it tense.

[0073] The 2nd move board 37 and the 3rd move board 51 are united, retreat, and they retreat [ the 4th block, the 5th block, the last block, etc. which carried out the polymerization before and after the right and left on both the move board 37 and 51 are united, and ]. As shown in drawing 14 , 40 [ block / 4th / block / 3rd ] dissociates from 29, and 29, block / 3rd / block / 2nd ] dissociates from 24. As the 3rd block [ 2nd ] block is indicated to be 29 to drawing 14 between 24, node d the thread t which results in 24 the 2nd block from 29 the 3rd block, and the thread t, i.e., for double top epilogues, which rotated the surroundings of the thread two times is exposed. As the 4th block [ 3rd ] block is indicated to be 40 to drawing 14 between 29, the thread t which results in 29 the 3rd block from 40 the 4th block, and the thread t which results in 40 the 4th block from 29 the 3rd block are exposed to a vertical position.

[0074] The node move equipment for double top epilogues moves to the inside by the side of a block, and as shown in drawing 14 and drawing 15 , the 4th block of the 3rd block of two thread-guard rods 85 for double top epilogues is inserted with 40 between 29 and between the thread t of a vertical position in the meantime.

[0075] The 3rd move board 51 retreats further independently, and the last block 53 grade on the 3rd move board 51 retreats. As shown in drawing 16 and drawing 17 , the 5th block of the last block 53 dissociates from 45, and 45 [ block / 5th / block / 4th ] dissociates from 40. As the 5th block [ 4th ] block is indicated to be 45 to drawing 16 between 40, node s the thread t which results in 40 the 4th block from 45 the 5th block, and the thread t, i.e., for single top epilogues, which turned the surroundings of the thread is exposed. As the 5th block is indicated to be the last block 53 to drawing 16 between 45, the thread t which results in 45 the 5th block from the last block 53 is exposed.

Moreover, the 4th block of the outlet side thread delivery roller 70 on the 3rd move board 51 keeps away from 40, and the thread t from 40 to the outlet side thread delivery roller 70 the 4th block becomes long.

[0076] The node move equipment for single top epilogues moves to the inside by the side of a block, and as shown in drawing 16 and drawing 17 , it is inserted between the thread t of between 45 and the meantime, and thread t with the

\*5th block from 40 to [ with thread / block / last / 53 ] the outlet side thread delivery roller 70 of the 4th block of two thread-guard rods 86 for single top epilogues.

[0077] it dissociated forward and backward -- the 3rd block of 29 and the thread t which separated into right and left, respectively as the 4th block [ 5th ] block indicated to be 40 in 45 to drawing 18 and drawing 19, and was inserted in the thread path of the inside of those blocks are exposed with 24, and the 2nd block is left

[0078] The node move equipment for double top epilogues moves forward going up, and as shown in drawing 20, two thread-guard rods 85 for double top epilogues move it to the right above position of the accessory r on the edge of Coil C, and an immediately after position. Node d for double top epilogues moves to the upper posterior of Accessory r. Moreover, it moves forward the node move equipment for single top epilogues also going up, and as shown in drawing 20, two thread-guard rods 86 for single top epilogues move to an immediately after [ two thread-guard rods 85 for double top epilogues ] position. Node s for single top epilogues moves to an immediately after [ two thread-guard rods 85 for double top epilogues ] position.

[0079] While the inversion drive of the entrance-side thread delivery roller 65 is carried out, the rotation drive of the outlet side thread delivery roller 70 is carried out, and as shown in drawing 20, the thread t of the both sides of node s for single top epilogues and the thread t of the both sides of node d for double top epilogues are pulled. Node s for single top epilogues and node d for double top epilogues are bound, respectively, and node d for double top epilogues is arranged in the ridgeline of the upper posterior of Accessory r.

[0080] The node move equipment for double square knot moves outside, and as shown in drawing 21, the thread-guard rod 85 for double square knot falls out from between Thread t, and comes out of it.

[0081] The node move equipment for single square knot moves forward, and as shown in drawing 22, two thread-guard rods 86 for single square knot move it to the right above position of the accessory r on the edge of Coil C, and an immediately after position. Node s for single square knot moves to the upper posterior of Accessory r. While the inversion drive of the entrance-side thread delivery roller 65 is carried out, the rotation drive of the outlet side thread delivery roller 70 is carried out, and as shown in drawing 22, the thread t of the both sides of node s for single square knot is pulled. Node s for single square knot is bound next to node d for double square knot.

[0082] The node move equipment for single square knot moves outside, and as shown in drawing 23, the thread-guard rod 86 for single square knot falls out from between Thread t, and comes out of it.

[0083] That is, the edge and Accessory r of Coil C are bound by the double square knot and single square knot of Thread t.

[0084] Then, while the inversion drive of the entrance-side thread delivery roller 65 is carried out, the rotation drive of the outlet side thread delivery roller 70 is carried out, and as shown in drawing 24, the thread t of the both sides of nodes s and d is pulled. Tonus of the thread t of the both sides of nodes s and d projects a cutter 89 toward the right above posterior of nodes s and d, as shown in drawing 24. V configuration nose of cam of a cutter 89 once bends the thread t of the both sides of nodes s and d to the side, and reaches the thread t bottom of the both sides of nodes s and d. As a cutter 89 is shown in drawing 25, it withdraws and the edge of V configuration nose-of-cam inside cuts the thread t of the both sides of nodes s and d.

[0085] The inversion drive of the entrance-side thread delivery roller 65 is carried out, and the rotation drive of the outlet side thread delivery roller 70 is carried out. Moreover, a suction system 59 operates. As shown in drawing 25, the amputation stump of the thread t inserted into the entrance-side thread delivery roller 65 retreats, and the last block blows it, and it is inserted in a hole 54. The scrap of the thread t inserted into the outlet side thread delivery roller 70 is absorbed by the siphon 58, and is discharged through a suction system 59.

[0086] A movable carriage 3 moves after cutting of Thread t, and the stator S by which Accessory r was bound to the edge of Coil C with Thread t moves to a stator fitting sampling position, and is sampled from the positioning shaft 4.

[0087] on the other hand, it is shown in drawing 26 -- as -- both -- the 1st -- block 13 -- approaching -- right and left -- : polymerization -- carrying out -- both -- the 2nd -- block 24 -- both -- the 3rd -- block 29 -- respectively -- approaching -- right and left -- a polymerization -- carrying out -- both -- the 4th -- block 40 -- both -- 45 approaches, respectively and carries out the polymerization of the 5th block to right and left

[0088] the 2nd move board 37 moves forward and it is shown in drawing 27 -- as -- both -- the 4th -- block 40 -- moving forward -- both -- the 3rd -- block 29 -- contacting -- both -- 29 pushes the 3rd block on an anterior -- having -- both -- the 2nd block contacts 24 moreover, the 3rd move board 51 moves forward and it is shown in drawing 27 -- as -- the last block 53 -- moving forward -- both -- the 5th -- block 45 -- contacting -- both -- 45 pushes the 5th block on an anterior -- having -- both -- the 4th block contacts 40 namely, -- both -- the 2nd -- block 24 -- both -- the 3rd -- block 29 -- both -- the 4th -- block 40 -- both -- the last block 53 carries out the polymerization of the 5th block to 45 in order

[0089] Moreover, it retreats the node move equipment for double square knot and the node move equipment for single square knot descending, respectively, and as shown in drawing 26 , the thread-guard rod 85 for double square knot and the thread-guard rod 86 for single square knot return to a former position, respectively. As shown in drawing 27 , the anterior roller of the outlet side thread delivery roller 70 rotates to a kickback side, and returns to a former position. As shown in drawing 27 , the siphon 58 descends and returns to a former position.

[0090] That is, each moving part returns to a former position.

[0091] After that, like last time, the following stator fits into the positioning shaft 4, an accessory is laid on the posterior part of the edge of the coil of a stator, and the edge and accessory of a coil are bound with thread.

[0092] although <modification> 1 example connects 2 \*\*\*\*\* for the block group for thread epilogues twice -- the block group for thread epilogues -- one group or 3 \*\*\*\*\* -- 1 time -- or it connects 3 times

[0093] 2) Although an example prepares the block group for double square knot, and the block group for single square knot and makes thread the double square knot and the single square knot, make it into how to prepare the block group for how to connect others, and tie thread for others.

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[Translation done.]

\* NOTICES \*

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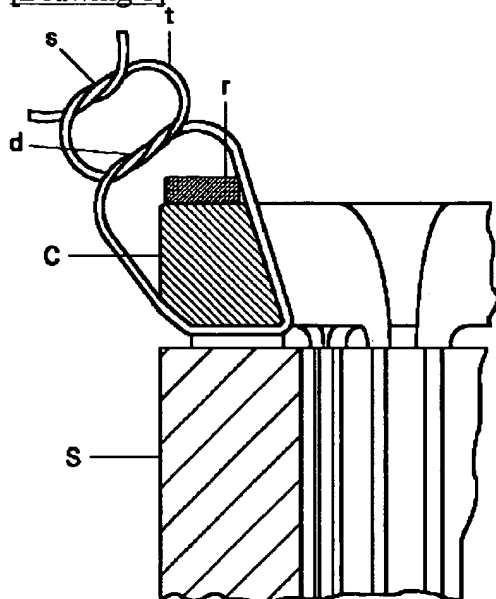
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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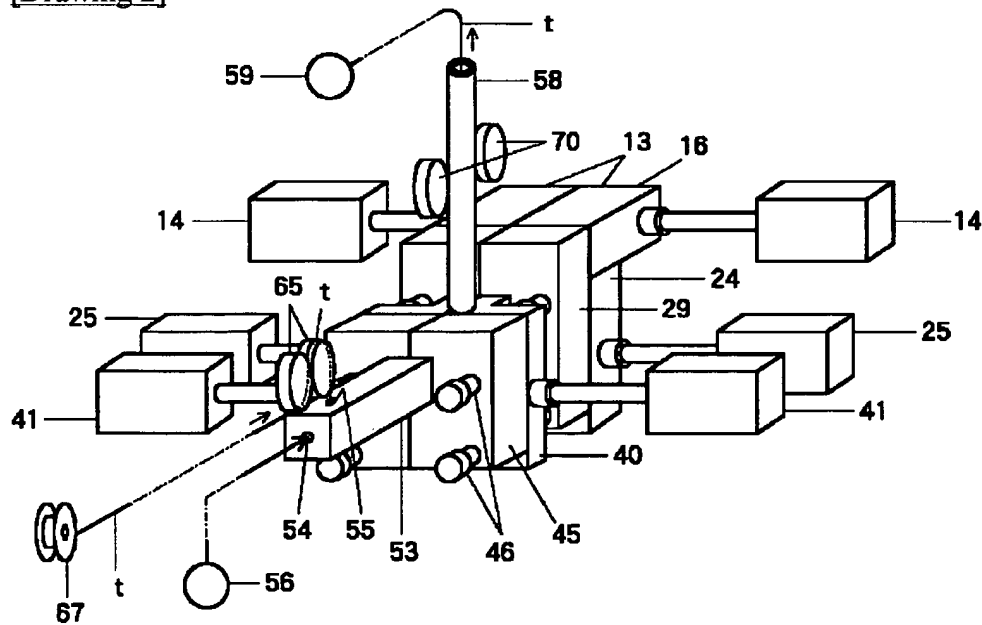
DRAWINGS

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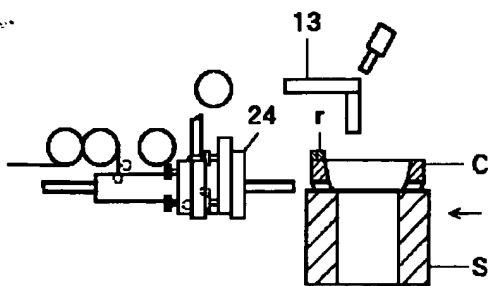
[Drawing 1]



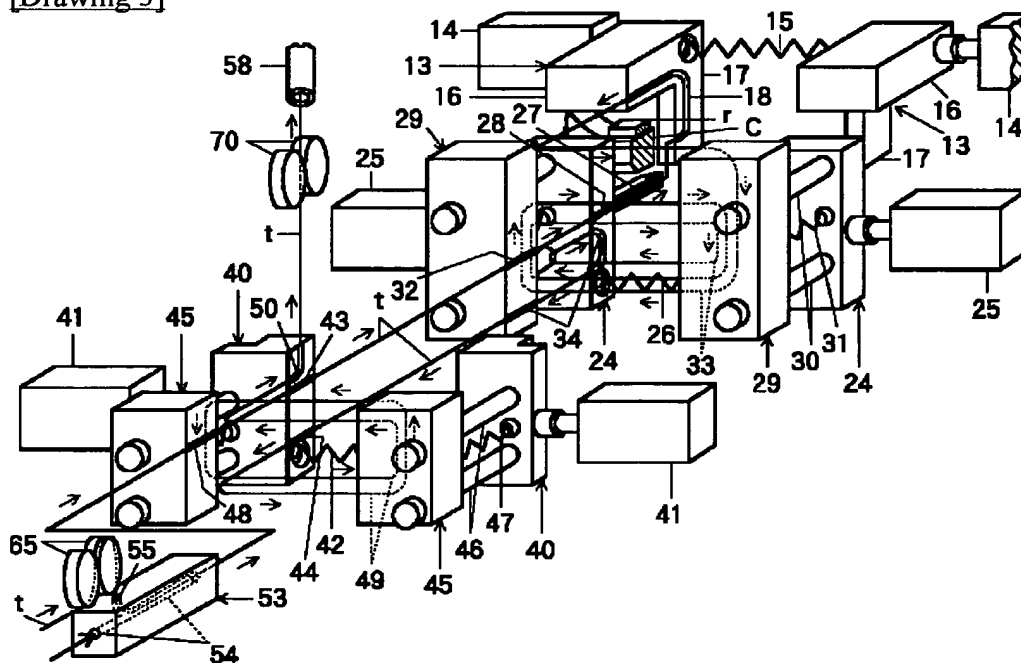
[Drawing 2]



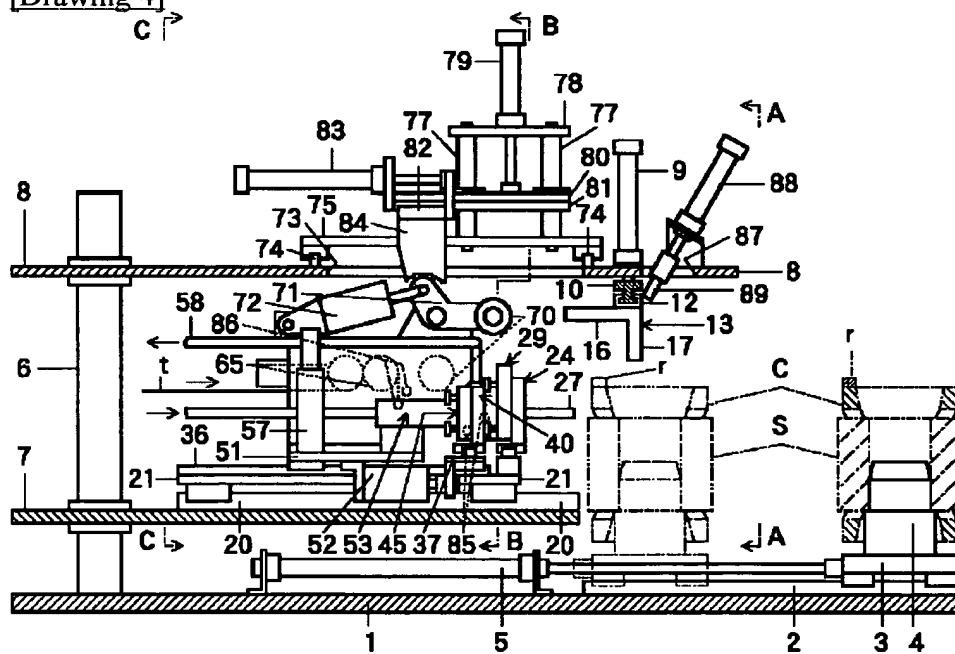
[Drawing 8]



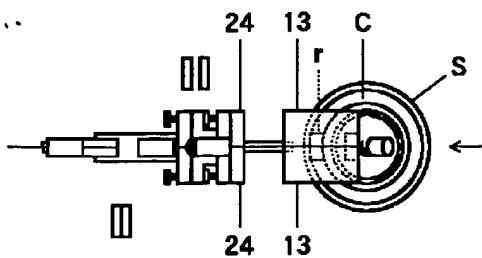
[Drawing 3]



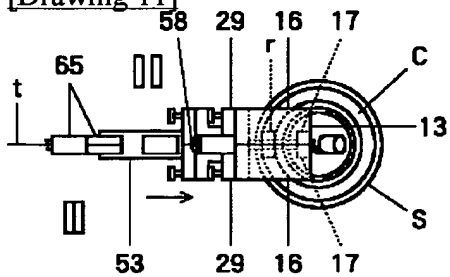
[Drawing 4]



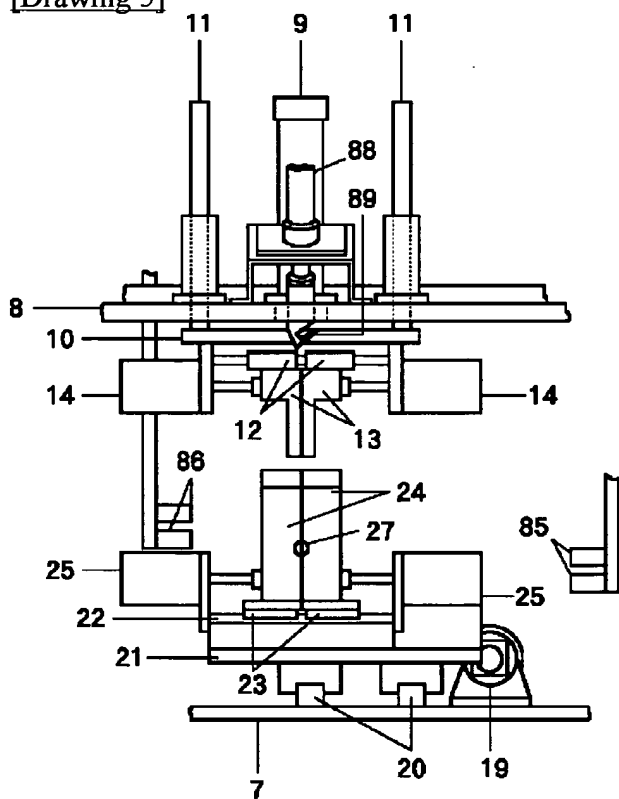
[Drawing 9]



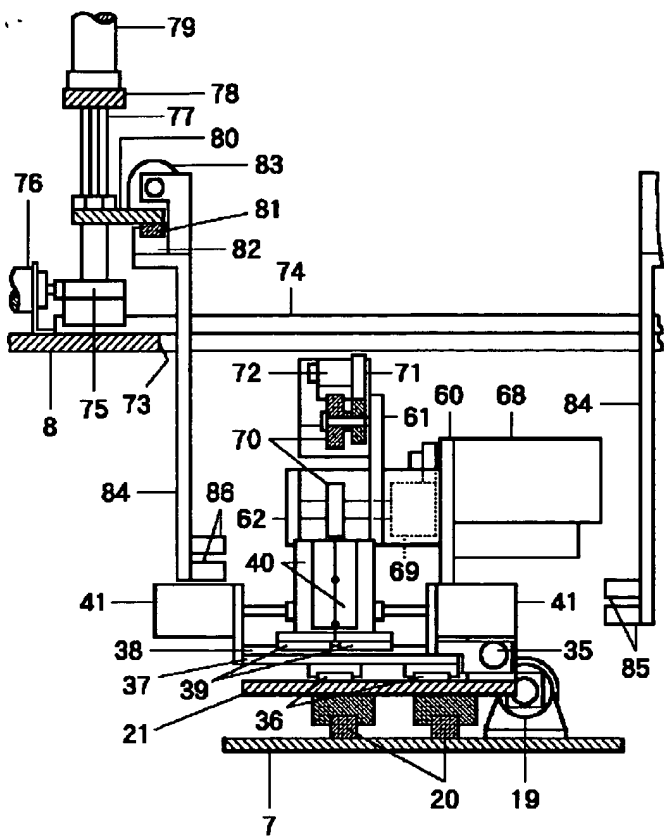
[Drawing 11]



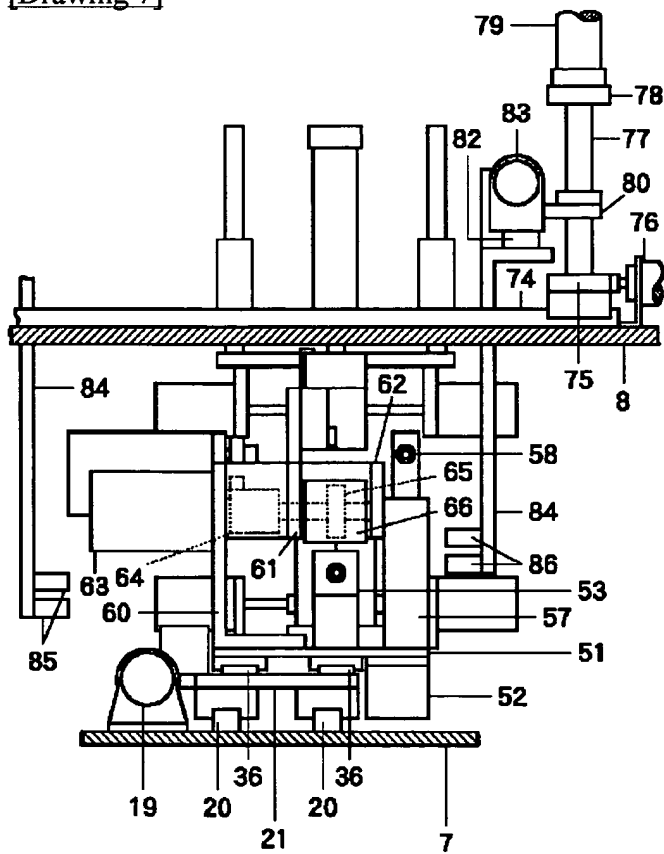
[Drawing 5]



[Drawing 6]

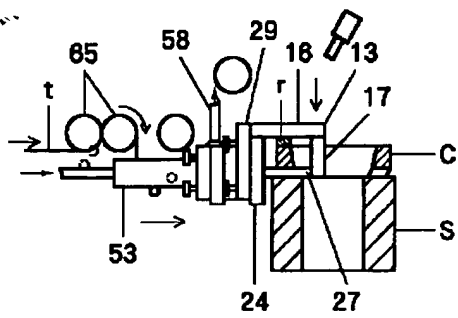


[Drawing 7]

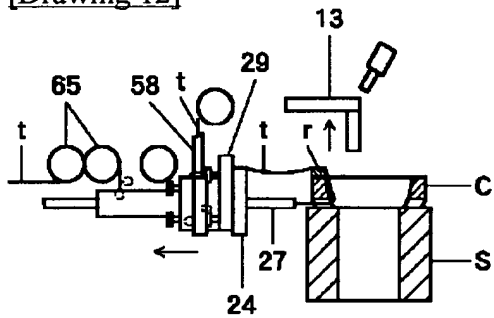


[Drawing 10]

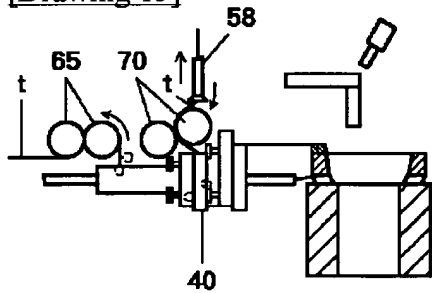




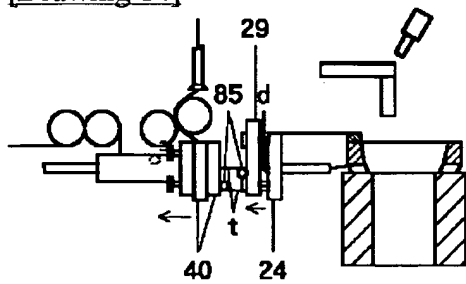
[Drawing 12]



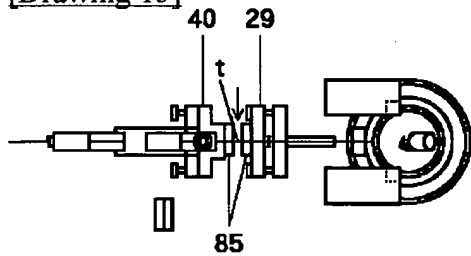
[Drawing 13]



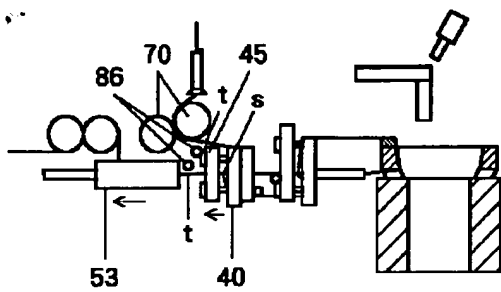
[Drawing 14]



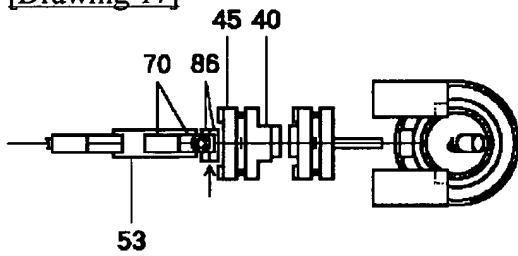
[Drawing 15]



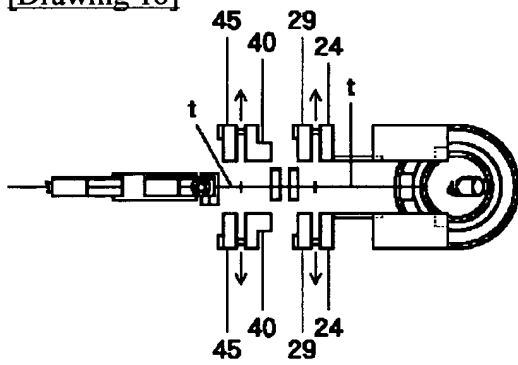
[Drawing 16]



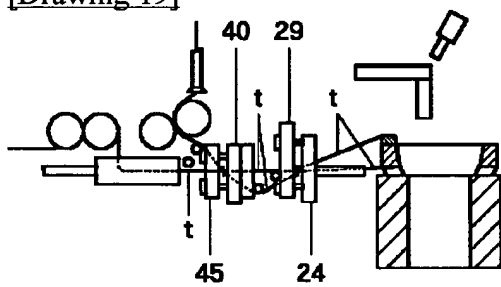
[Drawing 17]



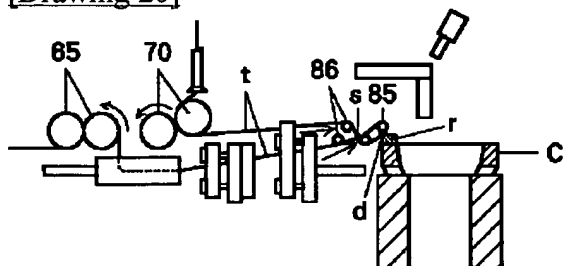
[Drawing 18]



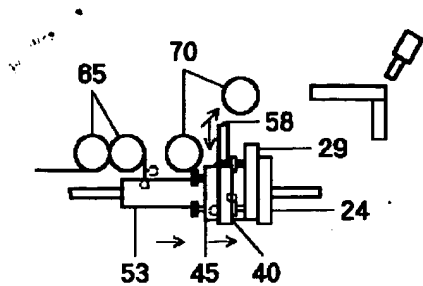
[Drawing 19]



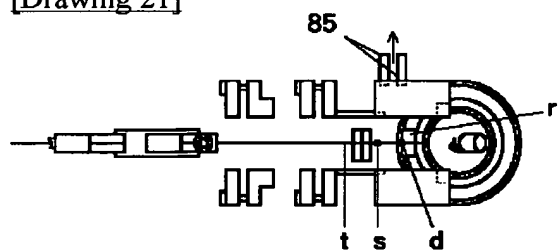
[Drawing 20]



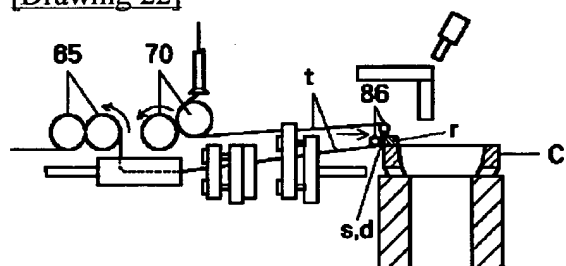
[Drawing 27]



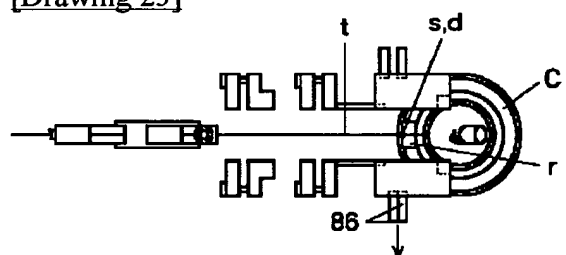
[Drawing 21]



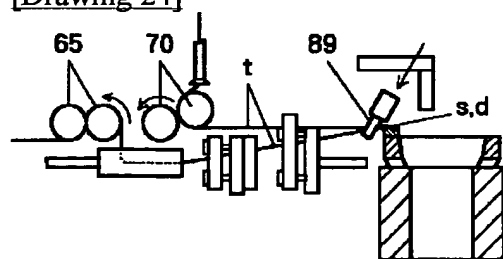
[Drawing 22]



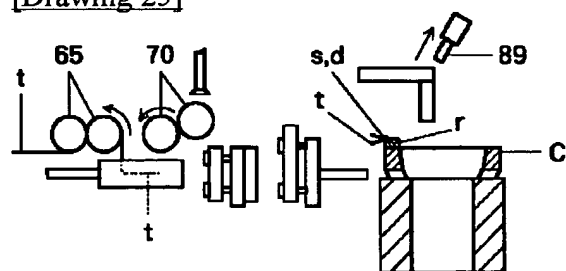
[Drawing 23]



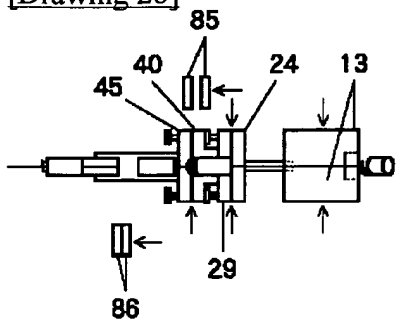
[Drawing 24]



[Drawing 25]



✓ [Drawing 26]



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[Translation done.]